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Dr. Genevieve Matanoski, an epidemiologist at the Johns Hopkins University School of Hygiene and Public Health, recently completed a mortality study of workers employed at six Navy and two private shipyards. This study, a milestone among studies of groups of workers exposed to radiation, is the largest of its kind. These workers were involved in the overhaul of nuclear powered vessels and have been occupationally exposed to low-level ionizing radiation. The purpose of the study was to determine if any excess risk of leukemia or other cancers was associated with exposure to low- level gamma radiation. Cobalt-60 (found within the piping system) is the primary source of gamma radiation associated with work on naval nuclear-powered ships. The study was funded by a Department of Energy grant.

The study population represents a sample of all civilian males who worked at least 1 year at the shipyards, beginning with the overhaul of nuclear-powered ships in 1957. More than 70,000 men were included in the study. The population consisted of two groups: 38,220 workers classified as radiation-exposed and 32,510 workers with no readiation exposure. The radiation-exposed workeres were selected from two group, men who received a cuulative radation dose of less than 0.5 rem, and men with a cumulative dose of 0.5 rem or more.

The data were analyzed to determine if the risk of death from all causes, leukemia and other blood-related cancers, lung cancer, mesothelioma (a cancer linked with exposure to asbestos), and other site-specific cancers in the shipyard worker population differed from the death rates for white males in the U.S. general population.

The results of this study indicate that the risk of death from all causes for radiation-exposed workers was much lower than that for U.S. males. Thse results are consistent with other studies showing that worker populations tend to have lower mortality rates than the general population because workers must be healthy to be hired and must remain healthy to continue their employment.

While total mortality was lower than expected when compared to the general population, it was highest for the shipyard workers not exposed to radiation. The death rates from leukemia and other blood-related cancers for both the radiation-exposed and non-exposed workers were similar to those for U.S. men.

The death rate for cancer among the radiation exposed workers was slightly lower than that for the U.S. population, but this decrease was not statistically significant. The corresponding death rate among workers not exposed to radiation was slightly highter (12 percent) due to a small increase of lung cancer.

An increased rate of mesothelioma, a type of cancer linked to asbestos exposure was found in both the radiation exposed and unexposed shipyard wokers. Mesothelioma was about 5 times highter than expected in the radiation-exposed workers and 2.5 times higher than expected in the unexposed. Even though elevated, the actual number of mesothelioma cases is samll (36 cases per 70,730 workers), reflecting the rarity of this disease in the general population. The researchers suspect that exposure to asbestos in the early years, when the hazards associated with asbestos were not well understood, might account for this excess risk of cancer. However, the study did not specifically look at asbestos or other possible hazards such as cigarette smoking. Additional studies are planned to investigate this observation and update the study with data beyond 1981.

The Johns Hopkins study found no evidence to conclude that the health of men involved in work on nuclear-powered ships has been adversely affected by exposure to low levels of radiation incidental to work on these ships.

This Health Bulletin is one in a series of routine publications issued by the Office of Health to share data from health studies throughout the DOE complex. This study was not funded by DOE and the authors' conclusions do not necessarily reflect those of the Department. For more information contact: Dr. Terry L. Thomas, Director, Health Coordination and Communication Division, Office of Epidemiology and Health Surveillance, U.S. Department of Energy, Washington, D.C. 20585; Telephone FTS 233-5328, Commercial (301) 353-5328.